PATENT
Appeal Brief
Under 37 CFR 1.192

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	SOUISSI	)	Examiner J. Lee
		)	
Appl. No.	09/651,382	)	Art Unit 2682
		)	
Filed:	29 August 2000	)	Atty. Docket No. PF01963NA

Title: "Method of Enabling Low Tier Location Applications"

APPEAL BRIEF UNDER 37 C.F.R. § 1.192(c)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Real Party In Interest

The real party in interest is, by virtue of an assignment duly executed by the named inventor(s) and recorded on 25 August 2000, REEL/FRAME 011056/0228.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Pending Claims 34-55 stand rejected and are the subject of the instant appeal. The appealed claims are reproduced in the attached Appendix.

Status of Amendments

Claims 34-51 and Claims 54-55 were amended once in a communication filed on 6 March 2002. No subsequent amendments have been filed.

Summary of Inventions

The inventions are drawn generally to mobile station positioning, for example locating wireless communications devices in cellular communications networks. In one embodiment, a coarse location of a mobile wireless communications handset is determined based on base station location information and on cellular area information received from a base station transmitter. In other embodiments, the coarse location of the mobile wireless communications handset is computed based on the base station power measurement information and/or bearing information and/or the bearing angular width information with some or all of the information discussed in the embodiment above. The coarse location may be used to compute a refined location or to reduce a GPS search space when computing GPS based location fixes. These and other aspects features and embodiments of the inventions are discussed more fully in the instant patent specification.

Issues for Consideration on Appeal

Whether Claims 34-55 are non-obvious in view of U.S. Patent No. 6,289,280 (Fernandez) and U.S. Patent No. 6,111,538 (Schuchman) under 35 U.S.C. 103.

Grouping of Claims

Claims 34-55 do not stand or fall together regarding the rejection under 35 USC 103.

Discussion Of Issues

Summary of Fernandez

Fernandez discloses a GPS/terrestrial hybrid cellular phone location scheme based upon the solution of a system of linear equations, including an altitude equation, a satellite measurement equation, a time aiding equation, and a terrestrial measurement equation. Fernandez, col. 6, lines 45-56. In Fernandez, the altitude and satellite equations are linearized around an initial estimated location of the cellular phone. Fernandez discloses several examples of the initial estimated location, including the use of the sector or location of a nearby terrestrial transceiver, Fernandez, col. 6, lines 59-col. 7, line 6, but not location and cellular area information.

Summary of Schuchman

Schuchman discloses a system of terrestrial navigation beacons, which may be co-located with cellular base stations, wherein the navigation beacons transmit direct or chirped spread spectrum signals having PN codes. In Schuchman, the timing and synchronization of the beacons are slaved to the Global Positioning System (GPS), for use in determining the position of mobile terminals. The positioning scheme of Schuchman is based upon triangulation. Particularly, in Schuchman, a 2-D position solution requires pseudorange measurements from 3 navigation beacons, and a 3-D position solution requires pseudorange measurements

from 4 navigation beacons, similar to the GPS navigation scheme. Schuchman, col. 7, lines 36-45.

Examiner's Allegations

Regarding Claim 34, the Examiner concedes that Fernandez "... does not specifically disclose the limitation 'base station location information'...", Official action 13 February 2002, para. 6, but the Examiner alleges that Schuchman "... discloses 'base station information' (column 3, lines 23-column 5, line 39, Fig. 1, abstract, and column 1, lines 43-column 2, lines 46)..." and that it would have been obvious to have provided the teaching of Schuchman to Fernandez

> ... because they both relate to cellular positioning system [sic] in mobile station for calculating and determining the mobile location by receiving information from base stations and satellites in mobile communication system [sic]. Propose [sic] the motivation for provide more accurate position determination of mobile station in order to further improve enhancing position location system in mobile station. Official Action, 13 February 2002, para. 6.

Applicants' Arguments

Regarding independent Claim 34, contrary to the Examiner's contentions, neither Fernandez nor Schuchman disclose or suggest a "method" in a mobile wireless communications handset comprising

> ... receiving base station location information of a cellular communication base station;
>
> receiving base station cellular area information for the cellular communication base station for which the base station location information is received;

determining a coarse location of the mobile wireless communications handset based on the base station location information and on the cellular area information.

Fernandez uses terrestrial location information to determine a GPS location fix when there is insufficient GPS information to compute the position desired. Fernandez, col. 6, lines 33-39. In Fernandez, location is based upon a non-iterative solution of a system of linear equations, including an altitude equation, a satellite measurement equation, a time aiding equation, and a terrestrial measurement equation. Fernandez, col. 6, lines 45-56. The terrestrial measurements disclosed by Fernandez include terrestrial pseudorange measurements, round trip delay (RTD) measurements, and terrestrial time difference of arrival measurements.

Schuchman discloses a system of terrestrial navigation beacons, which may be co-located with cellular base stations, wherein the navigation beacons transmit direct or chirped spread spectrum signals having PN codes. In Schuchman, the timing and synchronization of the beacons are slaved to the GPS for determining the position of mobile terminals by triangulation. Schuchman, col. 7, lines 36-45.

Combining Schuchman with Fernandez, as suggested by the Examiner, would no more than supplement GPS information of Fernandez with terrestrial location information obtained by triangulation with the terrestrial beacons of Schuchman. That Fernandez and Schuchman both disclose different location schemes suggests strongly that the Examiner's alleged combination is motivated by hindsight instead of suggestion in the prior art. It also raises substantial doubt over whether the combination of Fernandez and Schuchman would produce an operable location scheme, since the triangulation location scheme of Schuchman appears not to be one of the terrestrial schemes used by Fernandez to supplement GPS location information.

Contrary to the Examiner's assertion, the terrestrial beacons of Schuchman do not transmit "base station location information". In Schuchman, the

terrestrial beacons transmit spread spectrum PN codes, which may identify the beacons, but there is no disclosure or suggestion in Schuchman that the beacon PN codes identify communication "base station location information" as in the claims inventions. Also, there is no disclosure of suggestion in either reference for transmitting "base station cellular area information" to the mobile station. As noted, the beacons of Schuchman transmit PN code information. Thus neither Fernandez nor Schuchman disclose or suggest "...determining a coarse location of the mobile wireless communications handset based on the base station location information and on the cellular area information..." as recited in Claim 34.

Claim 34 and the Claims that depend therefrom are therefore patentably distinguished over Fernandez and Schuchman and in condition for allowance.

Regarding Claim 35, dependent from Claim 34, neither Fernandez nor Schuchman disclose or suggest "... determining a refined location of the mobile wireless communication handset based on the coarse location" in combination with the limitations of Claim 34. Claim 35 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 36, dependent from Claim 34, neither Fernandez nor Schuchman disclose or suggest "... the mobile wireless communications handset is a global positioning system (GPS) enabled mobile wireless communications handset, determining a GPS based location of the mobile wireless communications handset, reducing a GPS search space with the coarse location when determining the GPS based location of the mobile wireless communications handset." Fernandez computes location by non-iteratively solving a system of equations obtained from GPS and terrestrial source. Schuchman merely computes location by triangulation. Claim 36 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 37, dependent from Claim 34, neither Fernandez nor Schuchman disclose or suggest "... receiving a bearing and bearing angular width

information for the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, the bearing and the bearing angular width information." Contrary to the Examiner's contention, Fernandez makes no such disclosure. Rather, Fernandez determines location by non-iteratively solving a system of GPS/terrestrial equations, not based upon bearing and bearing angular width information. Claim 37 is thus further distinguished over the art and in condition for allowance,

Regarding Claim 38, dependent from Claim 37, neither Fernandez nor Schuchman disclose or suggest "... measuring power of a signal transmitted by the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, the bearing and the bearing angular width information, and the power measurement." Contrary to the Examiner's contention, Fernandez makes no such disclosure. Rather, Fernandez determines location by non-iteratively solving a system of GPS/terrestrial equations, not based upon bearing and bearing angular width information. Claim 38 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 39, dependent from Claim 37, neither Fernandez nor Schuchman disclose or suggest "... determining a refined location of the mobile wireless communications handset based on the coarse location" in combination with the limitations of Claim 37. Claim 39 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 40, dependent from Claim 34, neither Fernandez nor Schuchman disclose or suggest "... receiving bearing information from the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, and the bearing information." Contrary to the

Examiner's contention, Fernandez makes no such disclosure. Rather, Fernandez determines location by non-iteratively solving a system of GPS/terrestrial equations, not based upon bearing and bearing angular width information. Claim 40 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 41, dependent from Claim 40, neither Fernandez nor Schuchman disclose or suggest "... measuring power of a signal transmitted by the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, the bearing information, and the power measurement." The Examiner makes no particular allegation regarding the limitations of Claim 40 except to refer to the unrelated discussion of Claims 34 and 37, which recite different limitations. Claim 41 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 42, dependent from Claim 40, neither Fernandez nor Schuchman disclose or suggest "... determining a refined location of the mobile wireless communications handset based on the coarse location" in combination with the limitations of Claim 40. Claim 42 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 43, dependent from Claim 34, neither Fernandez nor Schuchman disclose or suggest "... measuring power of a signal transmitted by the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, and the power measurement." The Examiner makes no particular allegation regarding the limitations of Claim 43 except to refer to the unrelated discussion of Claims 34 and 37, which recite different limitations. Claim 43 is thus further distinguished over the art and in condition for allowance.

Regarding independent Claim 44, contrary to the Examiner's contentions, neither Fernandez nor Schuchman disclose or suggest a "method" in a mobile wireless communications handset comprising

> ... receiving bearing information from a plurality of at least two base stations,
> determining a coarse location of the mobile wireless communications handset based on the bearing information;
> determining a refined location of the mobile wireless communication handset based on the coarse location.

As discussed above, contrary to the Examiner's contention, Fernandez does not disclose or suggest computing refined location based upon "bearing information". Rather, Fernandez determines location by non-iteratively solving a system of GPS/terrestrial equations, not based upon bearing and bearing angular width information. Claim 44 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 45, dependent from Claim 44, neither Fernandez nor Schuchman disclose or suggest "... the mobile wireless communications handset is a global positioning system (GPS) enabled mobile wireless communications handset, determining the refined location by determining a GPS based location of the mobile wireless communications handset, reducing a GPS search space when determining the GPS based location by basing the GPS location determination on the coarse location." Fernandez computes location by non-iteratively solving a system of equations obtained from GPS and terrestrial source. Schuchman merely computes location by triangulation. Claim 45 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 46, dependent from Claim 44, neither Fernandez nor Schuchman disclose or suggest

> ... receiving base station location information of a cellular communication base station;
> receiving base station cellular area information for the cellular communication base station for which the base station location information is received;
> determining the coarse location of the mobile wireless communications handset based on the base station location information, on the cellular area information, and the bearing information.

Claim 46 is thus further distinguished over the art and in condition for allowance. As noted above, Fernandez computes location based upon non-iteratively solving a system of equations based upon GPS and terrestrial sources, and Schuchman computes position by triangulation. Claim 46 is thus further distinguished over the art and in condition for allowance.

Regarding independent Claim 47, neither Fernandez nor Schuchman disclose or suggest

> ... transmitting base station location information from at least one cellular base station;
> transmitting a cellular area of the at least one cellular base station for which the base station location information is transmitted;
> transmitting bearing information of the base station.

The failure of Fernandez and Schuchman to disclose or suggest the limitations of Claim 47 is discussed separately above in connection with the allowability of Claims 34, 37 and 44. There is no disclosure or suggestion for these elements in combination, since the prior art references do not disclose or suggest them separately. Claim 47 is thus distinguished over the art and in condition for allowance.

Regarding Claim 48, dependent from Claim 47, neither Fernandez nor Schuchman disclose or suggest "... determining a coarse location of a mobile wireless communication device in the network based upon the base station location information, the cellular area, and the bearing information of the at least one cellular base station." The failure of Fernandez and Schuchman to disclose or suggest limitations of Claim 48 is discussed above. Claim 48 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 49, dependent from Claim 47, neither Fernandez nor Schuchman disclose or suggest "... transmitting bearing angular width information for the cellular base station" in combination with the limitations of Claim 47. The failure of Fernandez and Schuchman to disclose or suggest limitations of Claim 49 is discussed above. Claim 49 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 50, dependent from Claim 49, neither Fernandez nor Schuchman disclose or suggest "... determining the coarse location of the mobile wireless communication device in the network based upon the base station location information, the cellular area of the corresponding cellular base station, and the bearing and the bearing angular width information." The failure of Fernandez and Schuchman to disclose or suggest limitations of Claim 50 is discussed above. Claim 50 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 51, dependent from Claim 47, neither Fernandez nor Schuchman disclose or suggest "... measuring power of a signal from the cellular base station, determining the coarse location of the mobile wireless communication device in the network based upon the base station location information, the cellular area of corresponding cellular base station, the bearing information, and the power measurement." The failure of Fernandez and Schuchman to disclose or suggest limitations of Claim 50 is discussed above in connection with the allowability of

Claim 38. Claim 51 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 52, dependent from Claim 47, neither Fernandez nor Schuchman disclose or suggest "...transmitting the base station location information, the cellular area, and the bearing information in a Provide Base Station Almanac Message" in combination with the limitations of Claim 47. Neither reference discusses the PBSA message containing the information recited in Claim 52. Claim 52 is thus further distinguished over the art and in condition for allowance.

Regarding Claim 53, dependent from Claim 47, neither Fernandez nor Schuchman disclose or suggest "... transmitting the base station location information, the cellular area, and the bearing information in a common message" in combination with the limitations of Claim 47. Neither reference discusses message containing the information recited in Claim 53. Claim 53 is thus further distinguished over the art and in condition for allowance.

Regarding independent Claim 54, neither Fernandez nor Schuchman disclose or suggest

> ... receiving base station location information for at least one base station;
> receiving a cellular area information for the base station for which the base station location information is received;
> receiving bearing information of the base station for which the base station location information and the cellular area information are received.

Fernandez computes position by non-iteratively solving a system of equations based upon GPS and terrestrial information, and Schuchman computes position by triangulating PN signals received from multiple terrestrial beacons. Neither Fernandez nor Schuchman disclose or suggest receiving "base station information" and corresponding "cellular area information" and "bearing

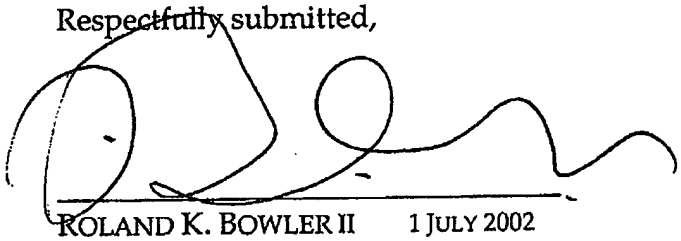
information". Claim 55 is thus patentably distinguished over the art and in condition for allowance.

Regarding Claim 55, dependent from Claim 54, neither Fernandez nor Schuchman disclose or suggest receiving the base station location information, the cellular area information, and the bearing information "in a common message". Claim 55 is thus further distinguished over the art and in condition for allowance.

Kindly reverse and vacate the rejection of Claims 34-55 for obviousness under 35 USC 103, with instructions for the Examiner to allow Claims 34-55 and allow said claims to issue as a United States Patent.

In view of the discussion above, the Claims of the present application are in condition for allowance. Kindly withdraw any rejections and objections and allow this application to issue as a United States Patent without further delay.

Respectfully submitted,



ROLAND K. BOWLER II 1 JULY 2002
REG. NO. 33,477

MOTOROLA INC.
INTELLECTUAL PROPERTY DEPT. (RKB)
600 NORTH U.S. HIGHWAY 45, AN475
LIBERTYVILLE, ILLINOIS 60048

TELEPHONE NO. (847) 523-3978
FACSIMILE NO. (847) 523-2350

APPENDIX: CLAIMS ON APPEAL

34. (Once Amended) A method in a mobile wireless communications handset, comprising:

receiving base station location information of a cellular communication base station;

receiving base station cellular area information for the cellular communication base station for which the base station location information is received;

determining a coarse location of the mobile wireless communications handset based on the base station location information and on the cellular area information.

35. (Once Amended) The method of Claim 34, determining a refined location of the mobile wireless communication handset based on the coarse location.

36. (Once Amended) The method of Claim 34, the mobile wireless communications handset is a global positioning system (GPS) enabled mobile wireless communications handset, determining a GPS based location of the mobile wireless communications handset, reducing a GPS search space with the coarse location when determining the GPS based location of the mobile wireless communications handset.

37. (Once Amended) The method of Claim 34, receiving a bearing and bearing angular width information for the cellular communication base station,

determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, the bearing and the bearing angular width information.

38. (Once Amended) The method of Claim 37, measuring power of a signal transmitted by the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, the bearing and the bearing angular width information, and the power measurement.

39. (Once Amended) The method of Claim 37, determining a refined location of the mobile wireless communications handset based on the coarse location.

40. (Once Amended) The method of Claim 34, receiving bearing information from the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, and the bearing information.

41. (Once Amended) The method of Claim 40, measuring power of a signal transmitted by the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, the bearing information, and the power measurement.

42. (Once Amended) The method of Claim 40, determining a refined location of the mobile wireless communications handset based on the coarse location.

43. (Once Amended) The method of Claim 34, measuring power of a signal transmitted by the cellular communication base station, determining the coarse location of the mobile wireless communications handset based on the base station location information, the base station cellular area information, and the power measurement.

44. (Once Amended) A method in a mobile wireless communications handset, comprising:

receiving bearing information from a plurality of at least two base stations,

determining a coarse location of the mobile wireless communications handset based on the bearing information;

determining a refined location of the mobile wireless communication handset based on the coarse location.

45. (Once Amended) The method of Claim 44, the mobile wireless communications handset is a global positioning system (GPS) enabled mobile wireless communications handset, determining the refined location by determining a GPS based location of the mobile wireless communications handset, reducing a GPS search space when determining the GPS based location by basing the GPS location determination on the coarse location.

46. (Once Amended) The method of Claim 44,

receiving base station location information of a cellular communication base station;

receiving base station cellular area information for the cellular communication base station for which the base station location information is received;

determining the coarse location of the mobile wireless communications handset based on the base station location information, on the cellular area information, and the bearing information.

47. (Once Amended) A method in a cellular communication system comprising a network of cellular base stations, the method comprising:

transmitting base station location information from at least one cellular base station;

transmitting a cellular area of the at least one cellular base station for which the base station location information is transmitted;

transmitting bearing information of the base station.

48. (Once Amended) The method of Claim 47, determining a coarse location of a mobile wireless communication device in the network based upon the base station location information, the cellular area, and the bearing information of the at least one cellular base station.

49. (Once Amended) The method of Claim 47, transmitting bearing angular width information for the cellular base station.

50. (Once Amended) The method of Claim 49, determining the coarse location of the mobile wireless communication device in the network based upon the base station location information, the cellular area of the corresponding cellular base station, and the bearing and the bearing angular width information.

51. (Once Amended) The method of Claim 47, measuring power of a signal from the cellular base station, determining the coarse location of the mobile wireless communication device in the network based upon the base station location information, the cellular area of corresponding cellular base station, the bearing information, and the power measurement.

52. (Not Amended) The method of Claim 47, transmitting the base station location information, the cellular area, and the bearing information in a Provide Base Station Almanac Message.

53. (Not Amended) The method of Claim 47, transmitting the base station location information, the cellular area, and the bearing information in a common message.

54. (Once Amended) A method in a cellular communication device comprising, the method comprising:

receiving base station location information for at least one base station;

receiving a cellular area information for the base station for which the base station location information is received;

receiving bearing information of the base station for which the base station location information and the cellular area information are received.

55. (Once Amended) The method of Claim 54, receiving the base station location information, the cellular area information, and the bearing information in a common message.